WHAT IS CLAIMED IS:

1. A method of simulating an electronic circuit, the electronic circuit having a plurality of ports, said method comprising:

identifying signal transmission characteristics associated with each of said ports;

selecting a plurality of test frequencies with which to measure frequency response of the electronic circuit at each of the ports;

identifying, for each of said test frequencies, a signal characteristic at each of said ports in response to an application of each of said test frequencies at each of said ports;

extracting scattering parameters corresponding to each of the ports, for each test frequency, based on said signal characteristics; and

transforming said scattering parameters into a time domain representation of said electronic circuit.

2. The method according to claim 1 wherein said extracting step includes forming, for each of said test frequencies, a scattering parameter matrix based on said signal characteristics.

3. The method according to claim 1 wherein said signal characteristics comprise signal voltages at respective ones of said ports.

4. The method according to claim 1 wherein said identifying step includes simulating an application of test signals corresponding to each of said test frequencies at each of said ports, wherein said test signals are applied to each of said ports one at a time through a predetermined characteristic impedance and remaining ones of said ports are terminated in said characteristic impedance.

5. The method according to claim 4 wherein said step of extracting includes determining a signal voltage at each of said ports in response to said simulating step and subtracting a predetermined value from a signal voltages at a port at which said test signals are applied to provide a scattering parameter representing reflective signal parameter values of said test signals.

6. The method according to claim 1 wherein said step of identifying signal transmission characteristics associated with each of said ports includes a step of using an n-dimensional field solver to extract parameter values.

7. The method according to claim 6 wherein said n-dimensional field solver comprises a two-dimensional field solver providing distributed component parameter values corresponding to said ports, said component parameter values including one or more of circuit capacitance, inductance, resistance and conductance.

8. The method according to claim 1 further comprising a step of simulating said electronic circuit using said time domain representation of said electronic circuit.

9. A method of simulating an electronic circuit, said method utilizing a digital processor and comprising:

identifying a plurality of signal transmission paths;

determining distributed electrical parameters associated with each of said transmission path;

associating port designations with terminal ends of each of said ports;

determining a signal voltage at each of said ports resulting from a sequential application of a test signal to each of said ports, one at a time, said test signal applied through a characteristic impedance while others of said ports are terminated in said characteristic impedance;

extracting scattering parameters corresponding to each of the ports based on said signal voltages determined at each of said ports; and

transforming said scattering parameters into a time domain representation of said electronic circuit.

10. The method of claim 9 wherein said test signal includes a plurality of non-overlapping discrete signal frequencies sequentially applied to said ports.

11. The method according to claim 10 wherein said extracting step includes forming, for each of said discrete signal frequencies, a scattering parameter matrix based on respective sets of said signal voltages.

12. The method according to claim 9 wherein said step of determining a signal voltage at each of said ports includes simulating said plurality of signal paths.

13. The method according to claim 9 wherein said electronic circuit comprises an integrated circuit and said signal paths comprise metalization layers formed on said integrated circuit.

14. The method according to claim 9 wherein said electronic circuit comprises a printed circuit board and said signal paths comprise transmission lines formed on said printed circuit board.

15. The method according to claim 9 wherein said step of determining distributed electrical parameters associated with each of said transmission path includes a step of using a two-dimensional field solver to extract parameter values of said distributed electrical parameters.

16. The method according to claim 15 wherein said distributed electrical parameters include at least one of a circuit capacitance, inductance, resistance and conductance associated with each of said signal transmission paths.

17. The method according to claim 9 further comprising a step of simulating said electronic circuit using said time domain representation of said electronic circuit.

18. An apparatus comprising code for controlling a machine to simulate a circuit based on simulation parameters, and machine-readable media on which the code is stored, the simulation parameters representing frequency-dependent response at each of a plurality of measurement ports, said code directing a machine to:

identify signal transmission characteristics associated with each of said measurement ports;

identify a plurality of test frequencies with which to measure frequency response of the electronic circuit at each of the measurement ports;

predicting, for each of said test frequencies, a signal characteristic at each of said measurement ports in response to an application of each of said test frequencies at each of said measurement ports;

extracting scattering parameters corresponding to each of said measurement ports, for each test frequency, based on said signal characteristics and

transforming said scattering parameters into a time domain representation of said electronic circuit to provide said simulation parameters.

19. The apparatus according to claim 18 wherein the code directs the machine to form, for each of said test frequencies, a scattering parameter matrix based on said signal characteristics.

20. The apparatus according to claim 18 wherein the code directs the machine to simulate an application of test signals corresponding to each of said test frequencies at each of said measurement ports, wherein said test signals are applied to each of said measurement ports one at a time through a predetermined characteristic impedance and remaining ones of said ports are terminated in said characteristic impedance.

21. The apparatus according to claim 18 wherein the code directs the machine to execute a two-dimensional field solver to extract parameter values corresponding to said signal transmission characteristics associated with each of said measurement ports.